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An Historical account of a strangely self-moving Liquor. By the Honorable Robert Boyle, Fellow of the Royal Society.

A N Ingenious Teacher of Mathematicks, having occasion to make a Composition for a new *Fire-Engine*, whereof he was to shew his *Majesty* a Trial, mingled divers Ingredients in an Earthen Pot, over kindled Coals ; but could not, or did not, do it so warily, but that the matter took fire, and began to blaze furiously ; which oblig'd him to stifle the flame as hastily as he could : and having removed the Vessel from the fire, and suffered it to grow cold ; when afterwards he came to look upon it, to see if what remained might be of any use to him, he was surpriz'd to find it variously and briskly mov'd. Wherefore having set it aside, to be sure that it might be throughly cold, he after some hours visited it again, and found it move as before. And having cast store of seeds upon it, to see if the Liquor would move them also, the Bituminous part of it connected them into a kind of thick Scum, that covered most of the *Surficies* ; but yet left some Intervalls, in which the Liquor appeared, and discovered that it continued its motions. Two days after, the *Engineer* discoursing with me of his Fire work, about which he had advised with me before ; told me, among other things, of this odd accident. And when I had asked him, if the motion continued still, and had been answer'd affirmatively, tho' it was then a dark night and ill weather, my Diffidence or my Curiosity made me engage him to send for the Pot as it was ; partly to be sure of the matter of Fact, and partly to try, if the knowledge I had of the Ingredients,

ents, which he had before told me, would afford any hint, of the cause of so odd an Effect; alike to which in kind, tho' not in degree, I had many years before devised, and successfully practised, the way of producing.

The Vessel being come, tho' the hasty transportation of it seem'd to have sufficiently disturbed it, there did appear manifest signs of such a motion, as the *Engineer* had ascribed to it; and therefore he being willing to leave it with me, I caus'd it to be set aside in a Laboratory, where some Furnaces kept the *Air* constantly warm, and did there and elsewhere, at distant times, look heedfully upon it, now and then displacing, or quite taking off, some of the thick Scum, that too much covered the surface of it; and by this means I had the opportunity to take notice of several *Phænomena*, whereof these are the chief,

First I observ'd, that the motion of this Liquor was not only brisk, but very various; so that having loosen'd some small portions of the Scum from the rest, one of them would be carryed towards the Right hand for instance, and another towards the left, at the same time.— 2. Where the Liquor first came out from under the Scum, it seem'd to move the most briskly, flowing almost like a stream, whose motion upwards had been check'd, and as it were reverberated, by that incumbent obstacle.— 3. Several motions in this Liquor were the more easy to be observ'd; because tho' it were dark, yet it was not uniform, consisting in part of Oyly and Bituminous Ingredients, which tho' they seem'd to have but one common *Surficies* with the rest of the Liquor, yet by their colours and power of vigorously reflecting the light, they were easily enough distinguishable from the rest. And I often observed, that some of these unctious portions of the matter, emerging to the surface of the Liquor, tho' perhaps

at first one of them would not appear bigger than a pins head ; yet in moving forwards it would at the same time diffuse it self circularly, and make as it were a great *Halo*, adornd with the colours of the *Rain-bow*, and so very vivid, as afforded a very pleasant, and at first surprizing, spectacle ; these Phantasms often nimblly succeeding one another, and lasting till they lost themselves against or under the thick Scum.—4. The motions of this odd Liquor were not only various, but frequently Vortical ; to be satisfyed of which I sometimes put short bits of straw, or Fragments of some such like stuff, upon the discovered part of the surface of the Liquor, by which they were carryed towards very distant, if not opposite, parts of the Vessel at the same time. But to make the Vortical motion more evident, I severall times detach'd considerably large pieces of the thick Scum, from the rest of the body : and had the pleasure to see them move both with a progressive motion in crooked lines, and with a motion about their own middle most parts. All this while the Liquor, whose parts were thus briskly mov'd, was actually cold, as to sense.—5. To observe what the presence, or absence, of the free *Air* would do to this Liquor ; I caused many spoonfulls of it, with some of the Scum, to be put into a *Cylindrical Glas*, which tho' large it self, had a Neck belonging to it, that was but about the bigness of ones Thumb, that it might be well stopt with a Cork. But having by this means kept the free *Air* from having a full and immediate contact with the whole surface of the mixture, as it had when that mixture lay in the wide-mouth'd Vessel ; I could not perceive the Liquor to move to and fro, no not tho' the Orifice of the Neck were left open : whereas having at the same time powr'd some of the Liquor into a very shallow and wide Mouthed Vessel, calld in the shops a clear cak'd *Glas*, it moved rather more than

then less nimbly and variously then in the great Earthen Pot, (which yet was of the same shape,) and shewed us many of those Vivid and self dilating Circles, that have been mentioned in the third Number. And these, by the fineness of their colours, and the quicknes wherewith they succeeded one another, afforded a delightfull spectacle as long as I staid to observe the Liquor.⁶ Tho' the motions of the hitherto mentioned Liquor did not seem to be always equally brisk, yet they appeared to continue manifest and various in some diversities of Weather, as to cold and heat; and when I lookt on it by Candle light, as well as by Day light. And when being not well enough to visit it my self, I sent one purposely to look upon it, about ten a Clock at night, he brought me word that it continued to move as formerly, and so it has done for ten days. And how much longer it will continue to do so; Time must determine,

Postscript.

Some time after the foregoing Account had been written, when I came to look upon the Liquor (which in the mean time had been severall times viewed, and appeared to retain its motions) I found to my trouble, that some body's impertinent curiosity and heedlessness had crackt the lower part of the Earthen Pot; at which overture the Liquor, tho' not the Scum, was run out: which had put a period to our Observations, but that, foreseeing that such an Accident might happen, I had long before taken out some spoonfulls of the Liquor, and kept it close stopt in a Vial. By this meaus I had the opportunity to observe, that when I powr'd out the Liquor into a wide mouthd Vessel it would move as before, tho' this were done some weeks after it had been put up. And I remember that long after, having one day received the Honor of a Visit from a forreign *Minister*, who was an Inquisitive person and

Man of Letters, we chanced among other things, to talk of this Liquor. And tho' it were scarce to be hop'd, that it could still retain any of its motive Virtue, yet, to gratify his Curiosity, and that of some ingeious men there present, I caused the Vial to be brought, and having unstopt it, I pour'd out the Liquor into a conveniently shaped Vessel; in which after we had suffered it to rest a while, they were delightfully surprized to see it move (tho' not in my opinion quite so briskly as before, yet) very manifestly and variously. This encouraged me to think it possible, that it might retain some motion, tho' but languid, 7 or 8 weeks after; and therefore on the 25th. of *July* I lookd upon it again; and having caused it to be pour'd into a *China* Cup, it manifested at first a brisk and various motion. But this after a while did so slacken, that I began to have some suspicion, that the motion it was put into by Effusion, and the first contact of the *Air*, might have given it the greatest part of its agitation. But this being but suspicion, I put the Vessel into divers postures in a Window, the better to discover the true cause of this *Phænomenon*: but whilst I was busy about this, which engrossed my attention; a mischance overturned the Cup, and, by throwing down the Liquor, put an end to my speculation. Yet this mischance hindred me but from observing, how long the odd agitation of our Liquor would have continued, but not from finding that it lasted a great while. For I shewed it the Forreign Minister about or after the beginning of *June*, that is, about five months, or more, after the Liquor was first observed to move.